Initial ideas - Group 3

Through the user study and evaluation, we have come up with the requirements for the plant care automation device as seen in Figure 1. These requirements are the things that are important to our users, and thus we will base our ideas around them.

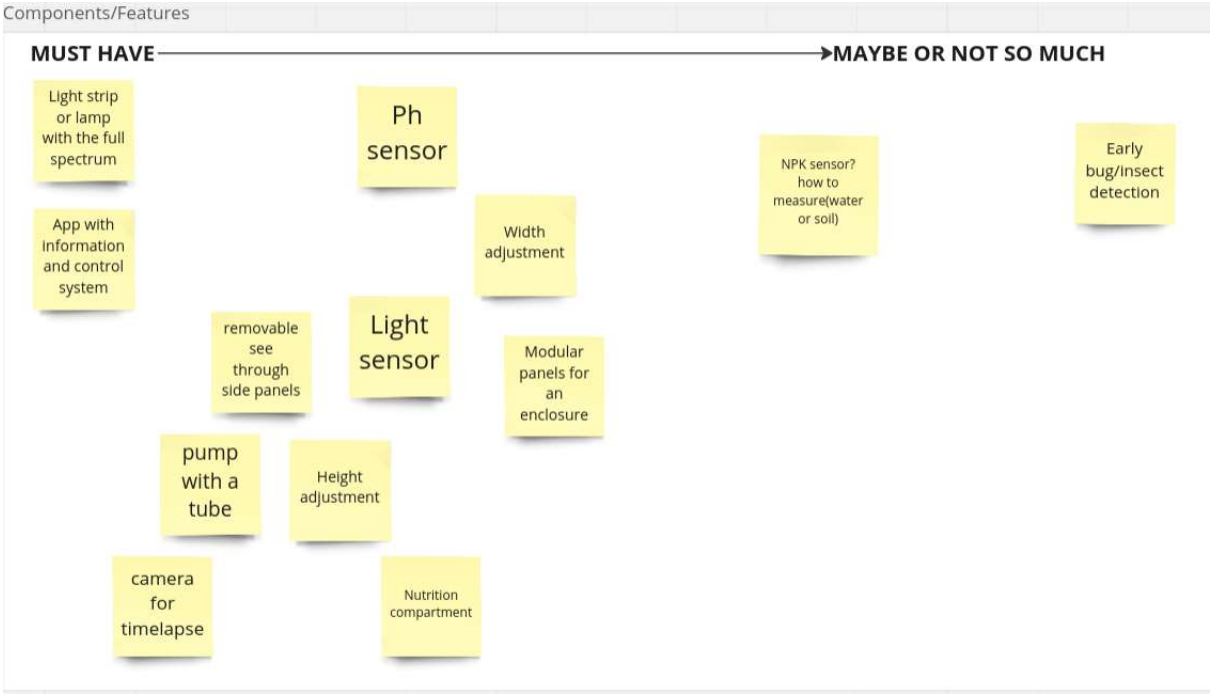


Figure 1: Device requirements

Based on the requirements, we have come up with the ideas below. All of them have one thing in common and that is the accompanying application. Depending on the design, the app will have different features, but the general purpose of the app is to provide measurements on humidity, nutrients, and other factors that affect plant growth. Some designs might allow the user the ability to control our device through the app, which will be discussed in further detail below.

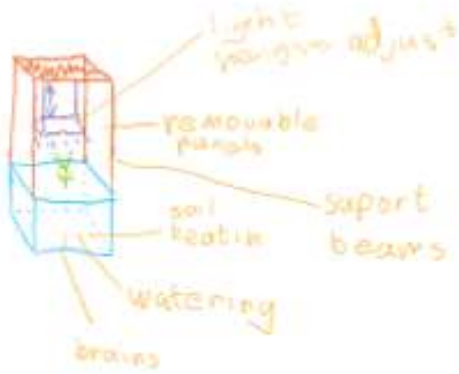
1. Stand-alone sensor kit for plants

The main idea is to make the device into a sensor kit that the users can install in any pot they have. The sensor will provide humidity and nutrient measurements for the plant, which can be viewed through the accompanying app. The application will also provide expert's recommendations on how to take care of different plant species, and the users can use that as reference to take care of their plant.

This idea is mainly focused on the everyday user who wants to semi-automate their plant care routine for their decorative plants. The device will be quite portable, and it is compatible with any pots the user has. However, it is not very feature-rich, as it only provides measurement and doesn't fully automate the plant caring process.

2. Enclosed growing pot

The second idea involves a device which acts as both the pot of the plant and the enclosure for the plant, all in one device. It would be capable of monitoring the air humidity inside the enclosure, the soil humidity, and the temperature inside the enclosure, and it would have a built-in air ventilation system, a heating system, a humidifier system, and a watering system to adjust the environment inside the enclosure to the user-set target values. There would also be a camera module for the user to remotely monitor the plant. The app for this device allows the user to adjust the target environment values as well as manually trigger the systems (e.g. watering the plant).



This was initially meant to allow people to use real plants for their aesthetic value without having to closely care for the plant. However, after conducting interviews, we realized that it would not cater very well to our target users, as users who do not want to involve themselves with plant care are unlikely to get a high-maintenance plant, nor will they be able to save their plant if the plant is inflicted with mold or bugs.

3. Modular plant growing kit

The third idea is to provide a somewhat all-in-one universal experience for the users. This device would be an enclosure to put your plant(s) in as is (with the pot) to automate the growing. This way, the user can use their existing pots that they have and just place them inside our growing kit. The modularity comes from the fact that the enclosure will be made out of modular tiles that the user can put together on their own. This will also allow them to expand the enclosure as the plant grows (which is usually the case). In addition, the user can remove the enclosure on demand, for example during summer when the temperatures are higher.

This device will also have all the possible automation capabilities that can be offered within the budget (watering, humidity control, lighting control, application with information …).

The difficulty with this approach is how to implement the modular system. It is proving to be a difficult problem to solve, but if we come up with a way to overcome it, this will probably be the best candidate for our final design concept.